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INSECT PEST SURVEY BULLETIN

Vol. 13

Summary for 1933

No. 10

INTRODUCTION

The winter of 1932-33 was generally milder than the average, with deficient rainfall in some sections, especially in the Southwest and the Great Plains. January was warm and dry, especially in the upper Missouri Valley; February was nearer normal, with some sudden and severe cold waves, and unusual cold in the mountain and Pacific States.

Spring was somewhat above normal in temperature, especially March. Rains were generally abundant in the eastern half of the country, and delayed farm work in the eastern part of the Corn Belt; in many parts of the West the moisture deficiency was unrelieved.

June was warmer than normal, especially in the Plains States, and continued drought in that region reached the stage of crop disaster in many localities. Many temperature records were broken. Farther east conditions were nearer normal, though rainfall was variable and often light. July was above normal in temperature except along the Atlantic coast; rainfall was quite variable, but more plentiful than in June.

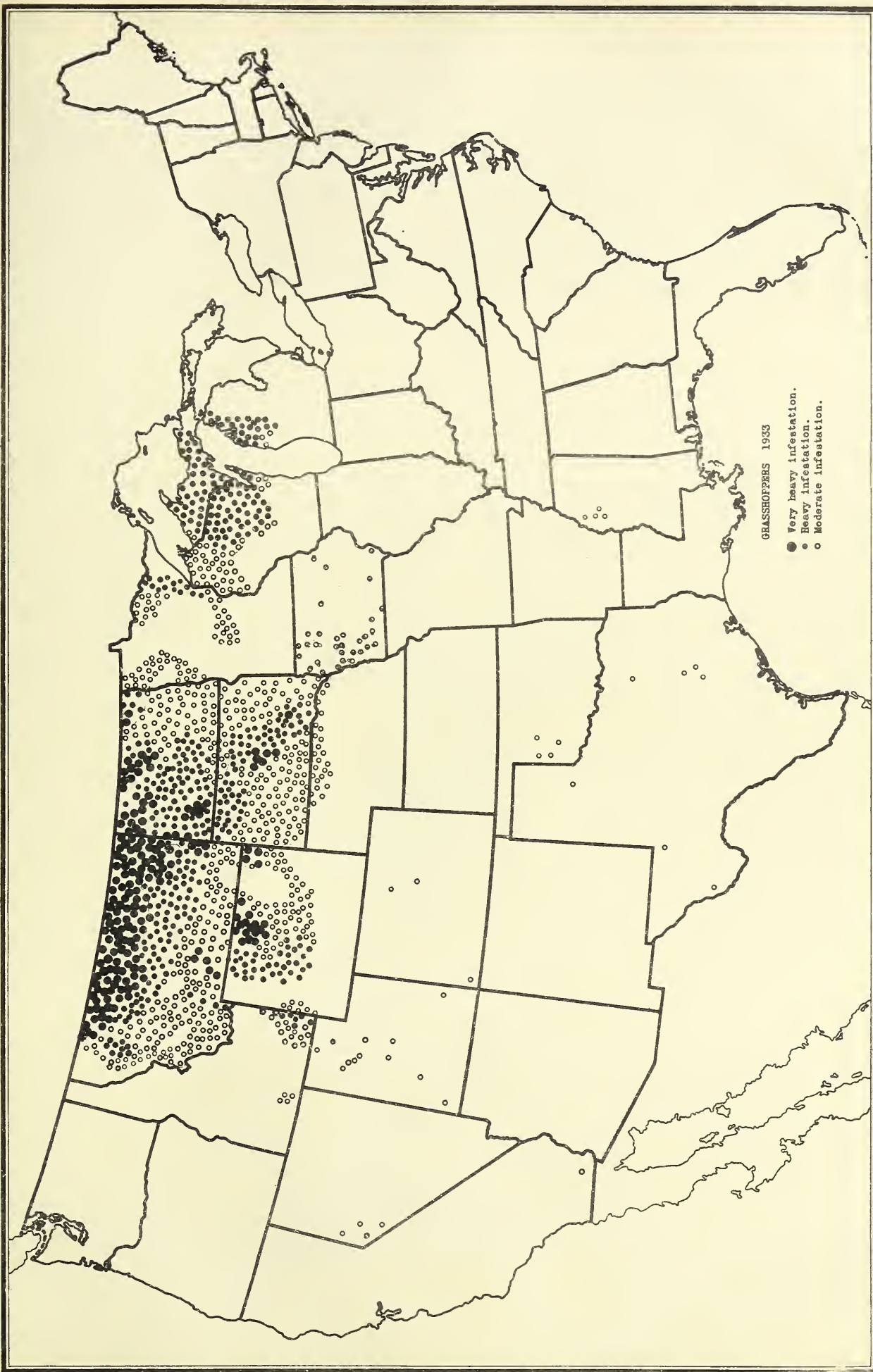
Late summer and early fall were marked by some relief from drought in the plains region and by an unusual number of tropical hurricanes, some affecting our eastern coast. These conditions are reflected in insect pest abundance in many cases, as brought out in the following pages.

GRASSHOPPERS

Although the grasshopper situation was much less alarming in the fall of 1932 than it was in the fall of 1931, the weather was extremely favorable during the hatching season and winter and spring mortality was extremely low in the Great Plains, the egg survival running from 90 to 95 percent over most of the territory. Heavy infestations occurred along the northern half of Montana east of the Rocky Mountains into the western half of North Dakota and across South Dakota in a band extending from the northwest to the southeast. A large area of heavy infestation occurred in north-central Wyoming and in the northeastern corner of that State, with an area of lesser infestation along the foothills of the Rocky Mountains. Beyond these areas moderate infestations occurred over the greater part of Montana, the northern two thirds of Wyoming, the southeastern corner of Idaho, and in northern Utah, the remainder of North and South Dakota, and along the northern border of Nebraska. In Minnesota, moderate infestation occurred in the northwestern part of the State, with more intense infestation in the northeastern and central parts. Somewhat severe damage was also recorded from the northeastern half of Wisconsin, practically the entire northern peninsula of Michigan, and the northwestern corner of the lower peninsula. Control campaigns were put on in several States as far as the extremely depleted finances of the farmers would allow. Scattered outbreaks were reported in Iowa, Oklahoma, Mississippi, Texas, Colorado, and Nevada. Populations continued heavy throughout the remainder of the summer, and there was considerable migration. The dominant species in the most heavily infested territory was the lesser migratory grasshopper, Melanoplus mexicanus Sauss. Fall egg surveys in northern plains indicate a very serious situation. The fall survey of this area for 1932 showed only 2 counties (in southwest North Dakota) which had egg populations sufficiently heavy to threaten from 50 to 100 percent of the crops this year in this entire territory; this year 35 counties are as heavily infested as this. Infestations running over 25 percent were found in 24 counties in the fall of 1932 and in 93 counties this fall. The most notable increase in seriously infested territory is across northern Montana and in north-central and northeastern Wyoming. This year comparatively heavy infestations are also reported from southeastern Idaho and northeastern Minnesota, with a very heavy infestation in northern and southwestern North Dakota and in central South Dakota. Similar heavy infestations extend well northward into Alberta, Saskatchewan, and Manitoba in Canada.

CHINCH BUG

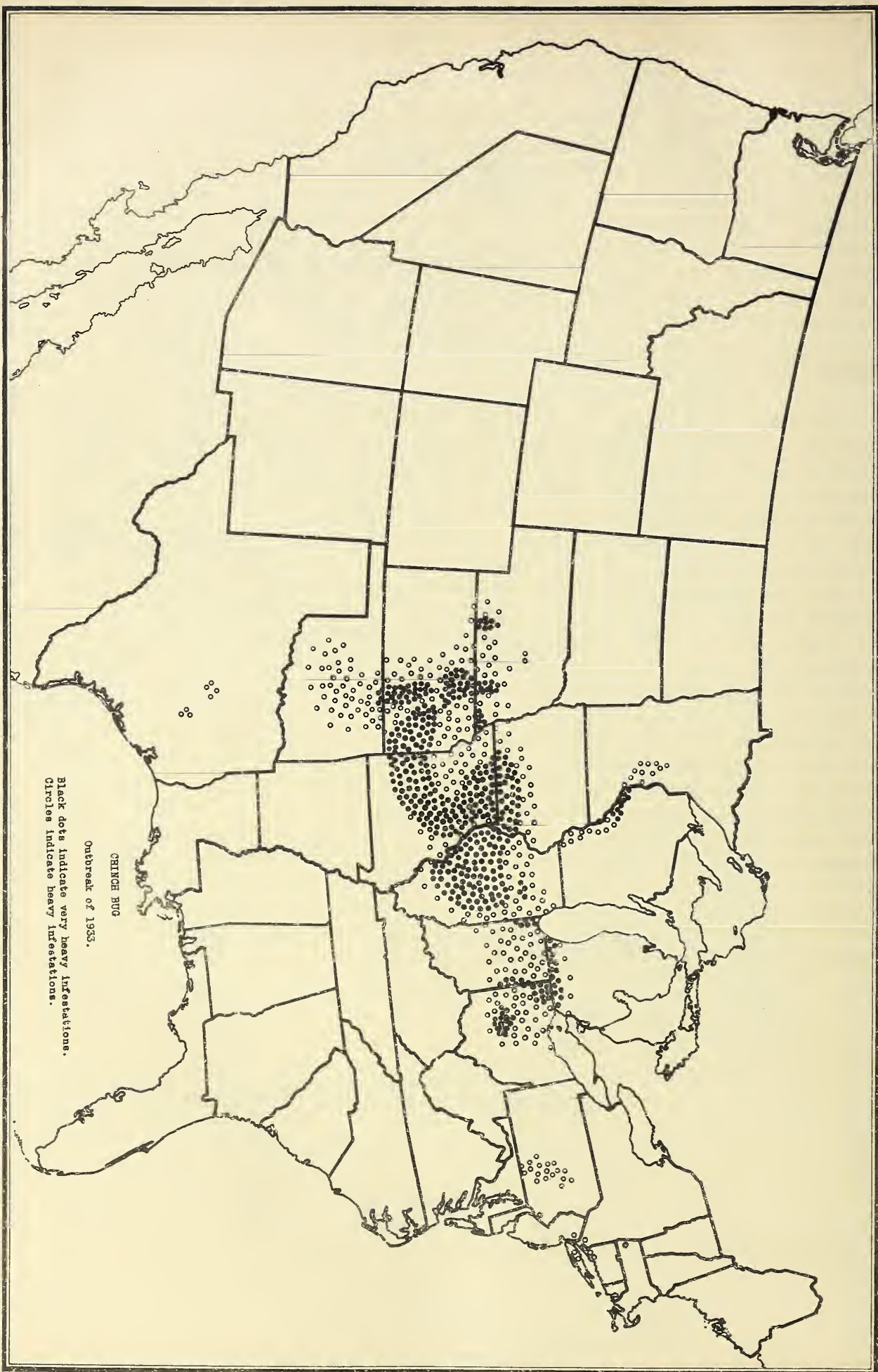
The chinch bug (Blissus leucopterus Say) overwintered successfully over the greater part of its normal habitat and also somewhat north of this region. Heavy rains late in April and early in May materially checked its development in many sections, particularly in the eastern part of the territory. Late in May and in June heavy populations built up in northern Missouri, central Illinois, northern Indiana, and west-central Ohio. During July and August severe depredations occurred from northern Missouri eastward to Ohio, with less important outbreaks extending from east-central Texas, across central Oklahoma and eastern Kansas, to southeastern Nebraska, thence eastward across southern Iowa to southern Michigan. In the fall generally heavy populations were reported throughout this entire territory; and an isolated heavy infestation occurred in ten counties in Pennsylvania extending from Adams County



GRASSHOPPERS 1933

- Very heavy infestation.
- Heavy infestation.
- Moderate infestation.





on the south-central border of the State northward to Columbia and Union Counties. In parts of New England and southern New York there were also unusual but light infestations. During September heavy flights to hibernating quarters were quite generally reported; and severe infestations are anticipated from Missouri eastward into Ohio, with a possibility of infestations over a much wider territory. During the late fall and early winter months entomologists of the infested States were organizing for winter destruction of hibernating quarters and a summer campaign for control of the imminent outbreak.

HESSIAN FLY 1

Infestations by the Hessian fly (Phytophaga destructor Say) in young wheat in the fall of 1933 were very light throughout most of the winter-wheat belt of the Central and Eastern States. The only area containing moderate to heavy infestations in many fields is southeastern Missouri, including the southernmost east-central counties, with considerable damage to some early-sown fields, especially in counties near the Mississippi River. Occasional fields containing light to rather heavy infestations occur in the following areas: A few counties of south-central Nebraska; southeastern Kansas, including the southernmost of the northeastern counties and the easternmost of the south-central counties; central and southwestern Missouri; south-central Tennessee; and south-central Pennsylvania. The factors responsible for the generally low infestation this fall are (1) the comparatively small number of puparia passing the summer in the stubble and (2) shortage of moisture in the greater part of the winter-wheat growing area during summer and fall. The latter factor affected Hessian fly abundance in three ways - inhibition of fall activity, restriction of volunteer wheat growth, and delay of wheat-planting operations so that the bulk of the crop came up late enough to escape infestation. There may be material injury to the 1934 crop in southeastern Missouri. Scattered fields may also be considerably affected in south-central Nebraska, southeastern Kansas, central and southwestern Missouri, south-central Tennessee, and south-central Pennsylvania. In the remainder and by far the greater part of the winter-wheat belt, however, injury of any consequence to the current crop is very unlikely.

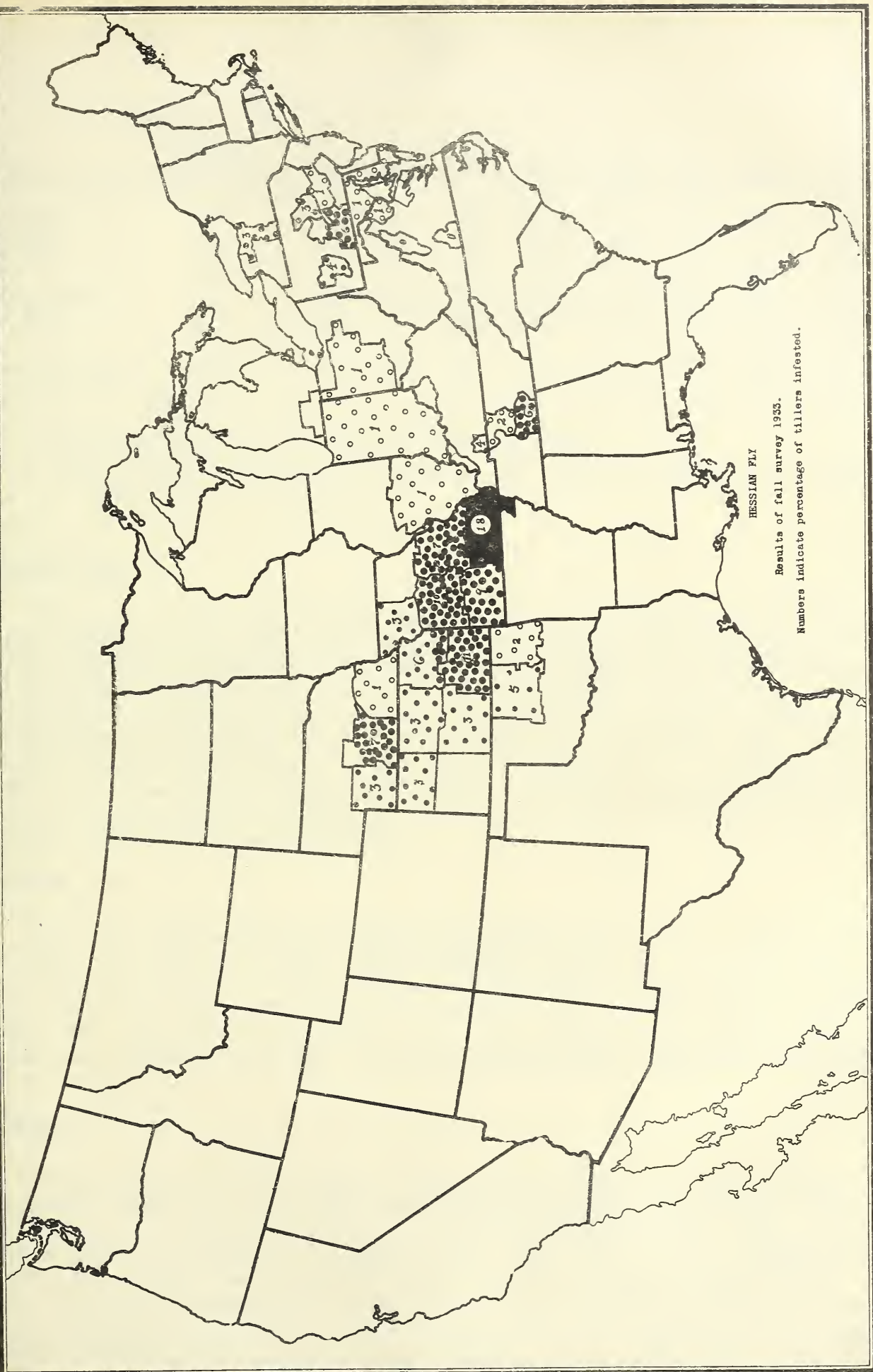
For purpose of comparison with the survey made last year we are appending a table of the State averages obtained by taking an average of the regional averages.

State	Percentage of infestation in 1932	Percentage of infestation in 1933
Nebraska	25	4
Kansas	21	5
Missouri	27	9
Oklahoma	4	3
Illinois	29	1
Michigan	19	trace
Indiana	41	1
Ohio	32	1
Kentucky	8	2
Tennessee	12	4
New York	10	3
Pennsylvania	32	3
Delaware	11	trace
Maryland	21	1
Virginia	11	1

EUROPEAN CORN BORER 2

Despite the general decrease in the population of the European corn borer (*Pyrausta nubilalis* Hbn.) in New York, many farmers complained of losses to early-planted sweet corn. The average plant infestation in 20 fields in nine counties bordering Lakes Ontario and Erie was 35.6 percent, and the average infested plant contained approximately 1.5 borers. The loss in ears for the 20 fields amounted to approximately 28 percent. The adults deposited eggs in comparatively large numbers, resulting in a moderately severe infestation in the vicinity of Toledo. In the other Ohio counties, however, the corn was delayed by lack of moisture, and because of its small size during the oviposition period few eggs were deposited upon it. The extremely warm, dry weather which prevailed throughout the oviposition period killed many eggs before they could hatch. Unfavorable conditions similar to those in Ohio prevailed over most of Michigan, although the sandy soil in that State absorbed the heavy spring rains more rapidly than did the Ohio soils, and it was possible to plant corn at the usual time. Extremely warm, dry weather, however, during the oviposition period killed many eggs. The fields examined were almost all late-planted and consequently were less heavily infested than the early-planted fields. Had it been possible to conduct the Michigan survey two weeks earlier, it is quite probable that the 1933 infestation survey data from that State would have been approximately equal to those of 1932.

The following table gives the average numbers of borers per 100 plants for the nine-year period 1925-1933, based on examinations made in comparable counties:





State	Number of counties compared*	1925	1926	1927	1928	1929	1930	1931	1932	1933
Michigan	6	1.4	23.6	64.7	45.2	31.1	22.6	32.6	51.6	29.6
Indiana	4	0	0	0	0.5	0.9	1.6	7.9	5.3	9.2
Ohio	10	7.6	33.9	24.0	40.2	42.8	13.8	36.1	38.0	52.7
Pennsylvania	1	13.7	41.7	73.4	9.7	17.3	5.4	2.5	8.3	6.1
New York	7	0.6	7.9	11.3	29.0	10.0	31.9	54.2	41.5	28.0
Area average**	28	3.6	20.6	27.9	31.7	25.1	18.2	34.7	36.0	33.6

* Averages made from comparable counties only.

** Area average obtained by totalling the county averages and dividing by the number of counties.

CORN EAR WORM

The corn ear worm (Heliothis obsoleta Fab.) was much more abundant than usual throughout the South. At points in the Gulf region 80 percent of the winter corn was rejected at the packing shed on account of infestations and 100 percent infestation was quite general. Throughout the Middle Atlantic, East Central, and West Central States infestations were about normal, while in New England and the North Central States damage was decidedly less prevalent than was the case last year. In the South, in addition to attacking sweet corn, the larvae seriously infested tomato. In North Carolina they did some damage by burrowing into half-grown peaches; this was usually a consequence of cutting vetch in the peach orchards.

ARMYWORM

The first adult armyworm (Cirphis unipuncta Haw.) of the season to be recorded was taken in a light trap at Clemson College, S. C., March 19. During the first week of April heavy flights of moths occurred in central Illinois. Late in May the first outbreaks of the season were reported from St. Marys County, Md., and James City County, Va. Late in May and throughout June outbreaks were reported from West Virginia, Pennsylvania, Tennessee, Wisconsin, and North Dakota.

CUTWORMS

During the last week in March considerable damage was done to wheat in Kansas and Oklahoma by the army cutworm (Chorizagrotis auxiliaris Grote). This cutworm also damaged fall-sown alfalfa, oats, and vetch. The population at Manhattan averaged 45 cutworms per square foot, with a maximum record of 90. This species was found in wheat fields in Cascade County, Mont. After the spring advanced the usual reports of cutworm injury were received from practically the entire country. During May the army cutworm was again reported damaging small grain in South Dakota; and in early June, flights of

the moth were observed in Nebraska, indicating that this species has been prevalent in that State this year. The pale western cutworm (Porosagrotis orthogonia Morr.) was much less abundant this year than last in Montana. During June the black cutworm (Agrotis ypsilon Rott.), locally known as the overflow worm, appeared in outbreak numbers on bottom lands that had been overflowed during March in Ohio, Indiana, Illinois, and parts of Tennessee. In Ohio and Indiana entire fields of corn were completely destroyed.

LESSER CORN STALK BORER

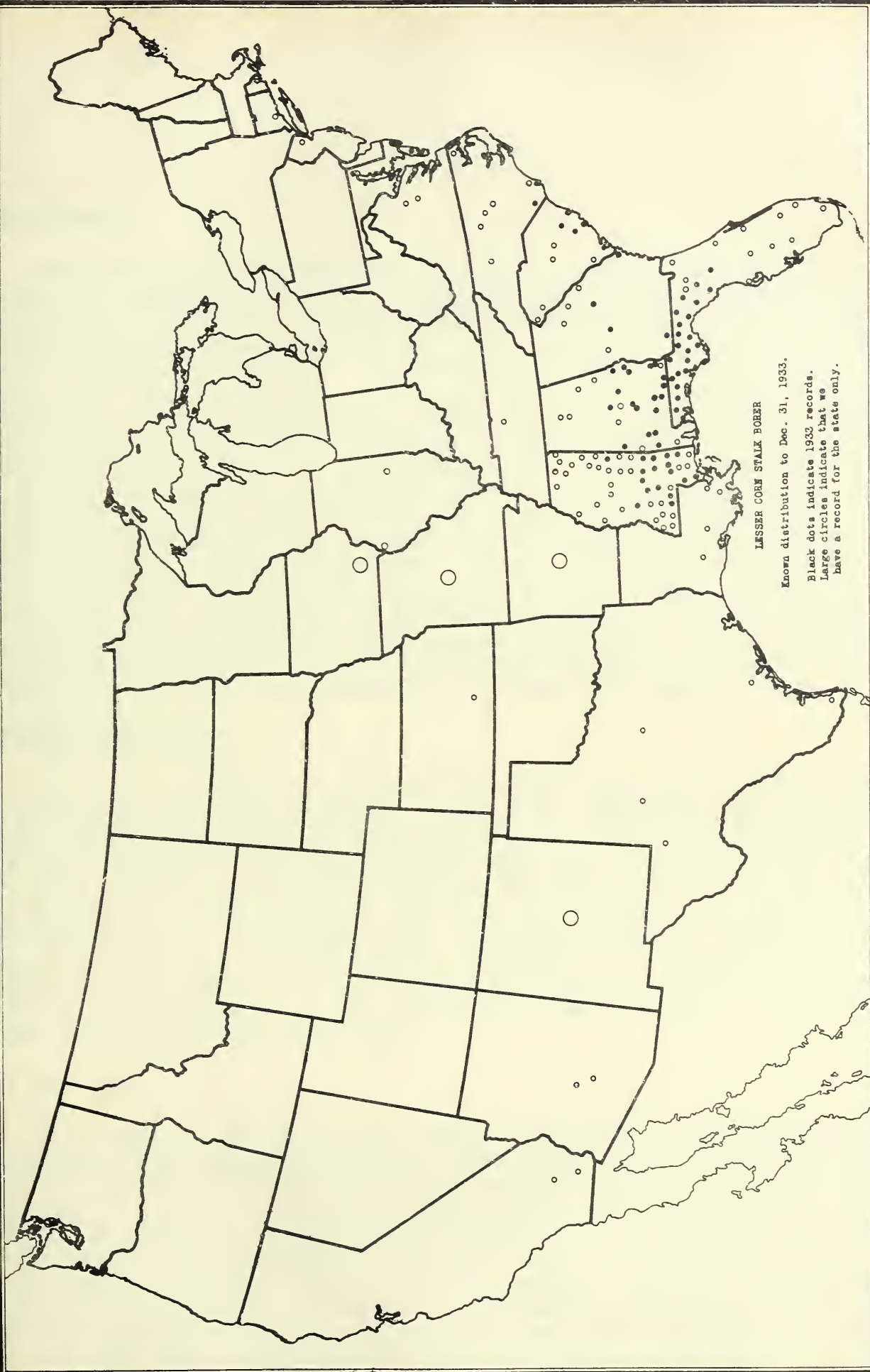
The lesser corn stalk borer (Elasmopalpus lignosellus Zell.) appeared in destructive numbers along the Atlantic seaboard from the Eastern Shore of Virginia to northern Florida and around the Gulf to the Mississippi River, extending northward to central Mississippi and Alabama. Heavy damage was occasioned to corn, with some damage to sugarcane, field peas, cowpeas, Irish potatoes, beans, and strawberries. At several points in northern Florida from 70 percent to complete loss of the late-planted corn crop was sustained, the plants breaking off in heavy wind. In some places in Georgia this insect, associated with the southern corn stalk borer (Diatraea crambidoides Grote), destroyed half of the corn crop.

ALFALFA WEEVIL 3

The alfalfa weevil (Hypera postica Gyll.) survived the summer of 1933 in exceptional abundance in Salt Lake and Sevier Counties, Utah, and in Churchill County, Nev. Its numbers were low at the beginning of the season because of unusual winter mortality, and this was the more important because a backward spring suppressed the oviposition until a late date. These conditions were offset, however, by a very warm, bright summer and a high winter death rate of the parasite Bathyplectes curculionis Thoms. The outlook, accordingly, subject to the developments of the winter, is for damage of economic proportions in the localities mentioned above, and elsewhere as weather conditions permit, except in western Idaho, where the weevil population is very low. The weevil apparently overwintered successfully in the infested area in California, the heaviest infestations being around Pleasanton, where, by the middle of May, from 300 to 800 weevils could be taken with 100 sweeps of the net. After the second cutting of the crop, populations were very low. Late in July the populations were greatest around Niles. But little damage was done throughout the infested area in California this year.

GREEN BUG

The green bug (Toxoptera graminum Rond.) appeared in injurious numbers on winter wheat in south-central Nebraska and southeastern Missouri following the very dry, warm weather during October and November. In the vicinity of Hastings, Adams County, Nebr., several fields were heavily infested.



LESSER CORN STALK BORER

Known distribution to Dec. 31, 1933.

Black dots indicate 1933 records.

Large circles indicate that we have a record for the state only.

OUTLINE MAP OF THE UNITED STATES



CODLING MOTHS

Although very heavy populations of larvae of the codling moth (Carpocapsa pomonella L.) went into the winter of 1932-33, severe subzero temperatures in the East Central States produced very heavy winter mortality. In northeastern Kansas and western New York survival was high, as was also the case in the Pacific Northwest. The spring season was very much delayed, however, in the Pacific Northwest, and in general but little damage was done in that region. Because of neglect of about 5 percent of the orchards in this region, however, a very heavy population of worms has built up, probably the heaviest ever recorded in the Pacific Northwest. Despite the setback received in the East Central States severe first-brood injury was reported from that region late in May and early in June, with similar heavy infestations in New England and western New York, westward through Michigan to Wisconsin and Iowa, and southward to Kansas and Tennessee. Later in the season second-brood and third-brood injury was reported from western South Carolina northward to western New York, and westward to Minnesota and Kansas. The only eastern State reporting low populations and slight damage was Delaware. In the East Central States Illinois reported the worst infestation in the last 20 years. Large numbers of larvae went into hibernation throughout the Eastern States.

ORIENTAL FRUIT MOTHS

The first adults of the oriental fruit moth (Grapholitha molesta Busck) to be observed were seen in Georgia on March 12. They were next observed in South Carolina on March 24, in Tennessee March 31, and in Delaware April 18. The insect seemed to be more troublesome than usual in parts of North Carolina and South Carolina, Mississippi, Arkansas, West Virginia, and Pennsylvania, and considerable fruit injury to quince was observed along the lake shores of Ohio and New York. Considerable fruit injury was reported throughout New England and the Middle Atlantic States, westward into Ohio and Indiana. Infestations over the remainder of the country were light to moderate; there was practically no damage in the Fort Valley, Ga., peach section. No material spread was recorded during the year.

SAN JOSE SCALE

The winter of 1932-33 was very adverse to survival of the San Jose scale (Aspidiotus perniciosus Comst.) in the East Central and the North Central States. Illinois reported 90 percent mortality, Missouri 66 percent, and Wisconsin 94 percent in Sheboygan County and from 80 to 90 percent in Racine County. In the South Atlantic States Georgia reported 92 percent mortality following the freezing weather in February, and in the Pacific Northwest Oregon reported 40 percent mortality. As the season advanced a decided increase in the population was noted in Massachusetts, Georgia, Illinois, and Oregon. In Georgia infestations were more severe than they have been during the last five years, and encrusted trees were found in practically all orchards in Upson and Peach Counties despite the high percentage of winter killing.

PLUM CURCULIO

The plum curculio (Conotrachelus nenuphar Hbst.) left hibernation quarters throughout the Eastern States at about the normal time. In the South Atlantic and southern East Central States winter mortality was very high; and early in the season larvae were very scarce. In the northern East Central and Middle Atlantic States, particularly in New Jersey and the Hudson River Valley of New York, damage was quite severe early in the season. First-generation beetles started to emerge near the normal date in the South. In Georgia the first adults appeared on May 27, 20 days earlier than last year, and in Tennessee on June 13, 8 days earlier than last year, which was a late year. However, the hot, dry weather prolonged emergence and then prevented oviposition by the few beetles that did come out; and the peach crop was harvested before any damage was done. Late in June and in July this insect was reported as very much more abundant than usual in the North Central States, particularly in Michigan and Wisconsin.

FRUIT APHIDS

Aphids attacking deciduous fruit were generally scarce throughout the Eastern States. Late in May, however, the rosy apple aphid (Anuraphis roseus Baker) developed to troublesome numbers in New York and Virginia, and early in June this species was more or less troublesome throughout the Middle Atlantic and South Central States.

SUGARCANE BORER

The survival of the sugarcane borer (Diatraea saccharalis Fab.) was unusually light in Louisiana and Mississippi following the severe cold weather of early February; and the larvae were scarce during the early summer. Late in August, however, the insect apparently increased rapidly. Several reports of severe damage in the Everglades of Florida were received.

BOLL WEEVIL 4

Because of the severe winter of 1932-33 few boll weevils (Anthonomus grandis Boh.) survived in Oklahoma, Arkansas, and northern Texas. In Louisiana weevils were so very abundant in the fall of 1932 that, in spite of the fact that less than one-fourth of 1 percent survived, they were about as abundant in the spring of 1933 as in the previous spring and considerably above the average. The survival was higher east of the Mississippi River and much higher than normal in the Atlantic States. Hot, dry weather in June and July greatly reduced the population in most of the States. This year's infestation was characterized by much local variation or "spottiness" caused chiefly by localized rains. The greatest damage in 1933 apparently was in Louisiana, Mississippi, and Oklahoma. Taking all of the infested States into consideration, the loss from the boll weevil was less than in 1932 but probably greater

than in 1930 and 1931. At present weevils are about as abundant as they were a year ago. In some areas where leaf worms (Alabama argillacea Hbn.) have defoliated practically all of the cotton the number of weevils going into hibernation will be greatly reduced. On the other hand, in some areas the weevil population is building up rapidly this fall on cotton that is sprouting from the stalks plowed under during the summer in the cotton-acreage reduction campaign. This cotton is putting on squares in which weevils are developing in large numbers.

PINK BOLL ~~WORM~~ 5

The pink boll worm (Pectinophora gossypiella Saund.) did not appear during 1933 in the counties in northern Florida in which the insect was found last season. One dead specimen was found, however, in gin trash in Madison County, Florida, on September 22, at some distance from the counties found infested the previous year. Progress is being made in the suppression of the outbreak on wild cotton on the keys and in the southern part of the State. Two fields were found infested in Berrien County, Georgia, in the late fall. In the Southwestern States the season was particularly notable from the continued failure to find any trace of the pink boll worm in the Salt River Valley of Arizona, and that valley was removed from the quarantined area, effective September 23. Several findings in the Staked Plains region of New Mexico and Texas, however, made it necessary to add Lea and Roosevelt Counties, New Mexico, all of Cochran, Hockley, Terry, and Yoakum Counties in Texas, and parts of Bailey, Lamb, and Dawson Counties in the same State, to the regulated areas. In some of these counties the insect was found in the fields, while in other cases it was discovered in gins in gin trash coming from cotton grown within the counties concerned.

MEXICAN BEAN BEETLE

Generally speaking, the Mexican bean beetle (Epilachna corrupta Muls.) caused severe losses to bean growers in the Eastern and Southeastern States during 1933. Survival over winter was high, and damage would have been more severe but for a prolonged drought in several States. Beans were severely injured, and in many cases destroyed, in New Jersey and Delaware. Injury was severe in parts of Pennsylvania, Maryland, Virginia (western counties and eastern shore), North Carolina, South Carolina, Tennessee, Alabama, northeastern Mississippi, Kentucky, and the Ohio River Valley in Ohio and Indiana. In some sections of the Ohio River Valley and also in eastern Tennessee, damage was lighter than usual. It will be recalled that this insect was first recorded in eastern Illinois last year. Infestation in that district was much lighter this year. The beetle was recorded, however, in seven additional counties in the southern part of the State, from Richland and Jefferson Counties to Massac and Union Counties. This year it occasioned considerable damage in southern Indiana. During July larvae were collected in the St. Paul-Minneapolis district of Minnesota, which is far northwest of its known distribution. This is believed to have been a commercial jump. This year it was found at Monticello, Fla., and in southern Mississippi. Although the insect was apparently introduced into north-central Alabama in about 1919, this is the first year that there has been any appreciable spread southward.

COLORADO POTATO BEETLE

Early in the season the Colorado potato beetle (Leptinotarsa decemlineata Say) was collected in Lake and Pasco Counties, Fla., which is south of the previous records in this State. It was unusually abundant in the northern and eastern parts of Wisconsin and across Minnesota into North Dakota during July. Conditions over most of the country were about normal. In Utah beetles were found in three localities along the Weber and Davis County line. In the Yakima Valley of Washington they were much more troublesome than usual.

VEGETABLE WEEVIL

Throughout the winter of 1932-33 the vegetable weevil (Listroderes obliquus Gyll.) occasioned considerable damage to turnip and mustard; late in the winter it was recorded as attacking cabbage, spinach, and carrots over the southern two thirds of Mississippi and throughout Louisiana. About the middle of March this insect was found at Clemson College, S. C. This is the first record in that State and the northeasternmost record for the distribution of the species.

PICKLE WORM

The pickle worm (Diaphania nitidalis Stoll) was unusually abundant in Alabama and Florida; many fields of cucumber, particularly those planted late, were completely wiped out in Florida, and 50 percent of the crop in Baldwin County, Ala., was rejected at the packing house. There was also considerable damage to summer squash. As the season advanced reports of damage were received from Mississippi, Kentucky, and Missouri. This year the insect did not persist in the northern part of its known range, where it had been troublesome during the two previous years.

TOMATO PIN WORM

The tomato pin worm (Gnorimoschema lycopersicella Busck) appeared again in troublesome numbers in northeastern Pennsylvania, where it not only infested greenhouse tomatoes but heavily infested numerous outdoor plantings near greenhouses. It was collected on tomatoes in a greenhouse in Norfolk, Va., in April. This is the first record of the insect in that State. In Florida, where it was first reported during 1932, it reappeared late in the season of 1933 but not nearly as seriously as the previous year.

HARLEQUIN BUG

The harlequin bug (Murgantia histrionica Hahn) evidently suffered heavy winter mortality along the Atlantic seaboard, as populations were generally light throughout that region. Very early in the season it was unusually abundant in the East Central States, particularly from southern Ohio and southern Indiana to central and eastern Tennessee. Later, however, it appeared to decrease in numbers and was not so serious as was originally anticipated.

FALSE CHINCH BUG

During June the false chinch bug (Nysius ericae Schill.) was reported from the West Central States through the Rocky Mountain region to the Pacific Coast, reports having been received from Minnesota, Iowa, Nebraska, Kansas, Colorado, Utah, Nevada, and California. Its principal damage was to cruciferous vegetables, though it was also reported as attacking strawberry, potato, tomato, and flax. It was also reported as damaging orchards and vineyards. In California the outbreak extended from the upper Sacramento Valley to San Diego. This insect occurred in such enormous numbers at Wells, Nev., that it invaded the theatres, which had to be closed until the migration ended.

PEA APHID

During May heavy infestations of alfalfa by the pea aphid (Illinoia pisi Kalt.) were recorded in New Jersey, Maryland, Kentucky, Missouri, and Kansas. In Maryland the outbreak was reduced to negligible proportions by a fungous disease. In Mississippi the insect was reported as attacking Austrian winter peas and English peas. In June it appeared in the cannery peas in Michigan.

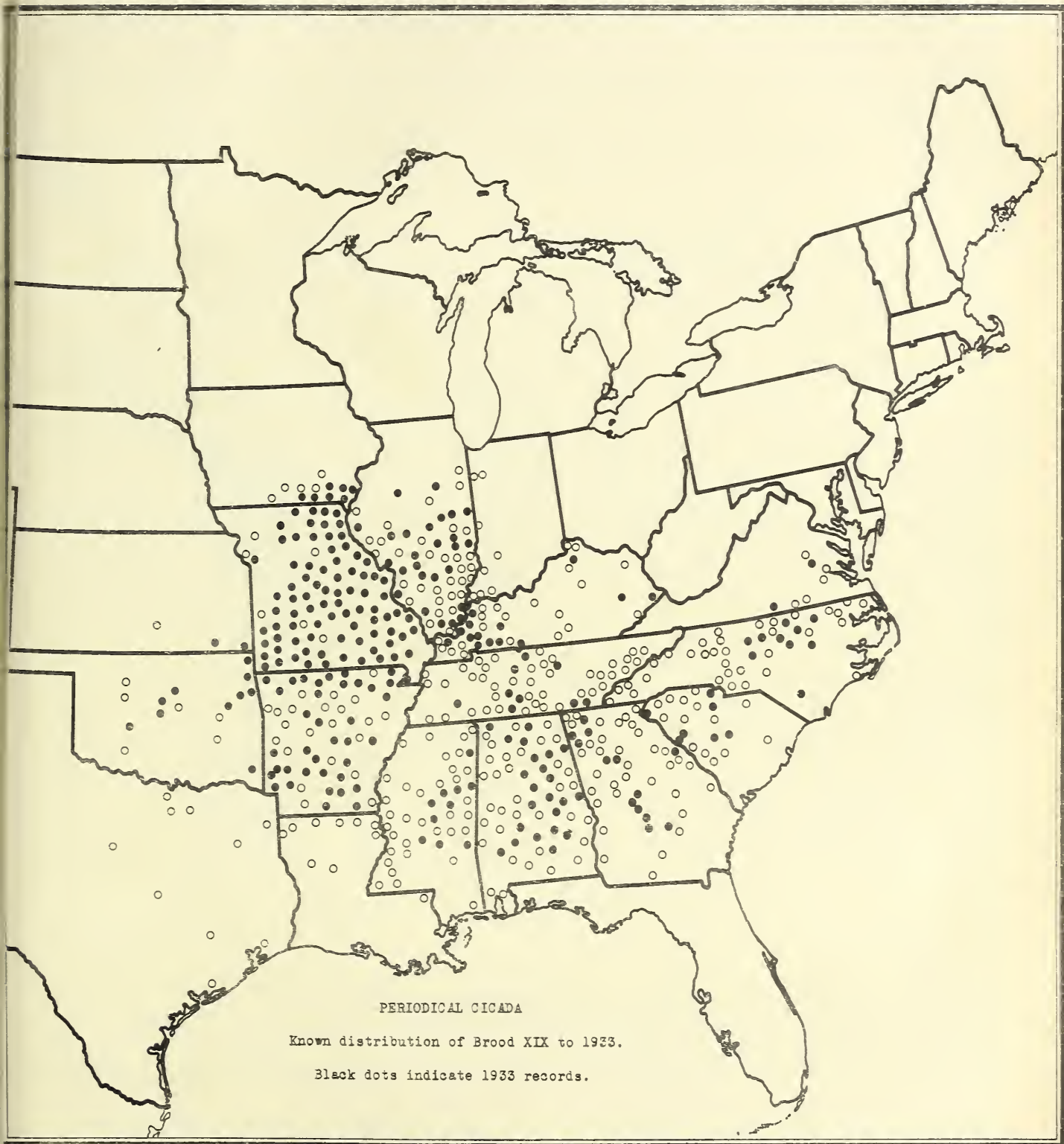
POTATO LEAFHOPPER

Late in June the potato leafhopper (Emboasca fabae Harr.) became very abundant in the Norfolk trucking section of Virginia. Reports of similar abundance were received from Ohio and Iowa. During July the insect and its associated hopperburn were reported as abundant and destructive from southern New England through the Middle Atlantic States westward to Illinois and Minnesota. In the western part of that area dry weather, associated with the hopperburn, produced severe losses.

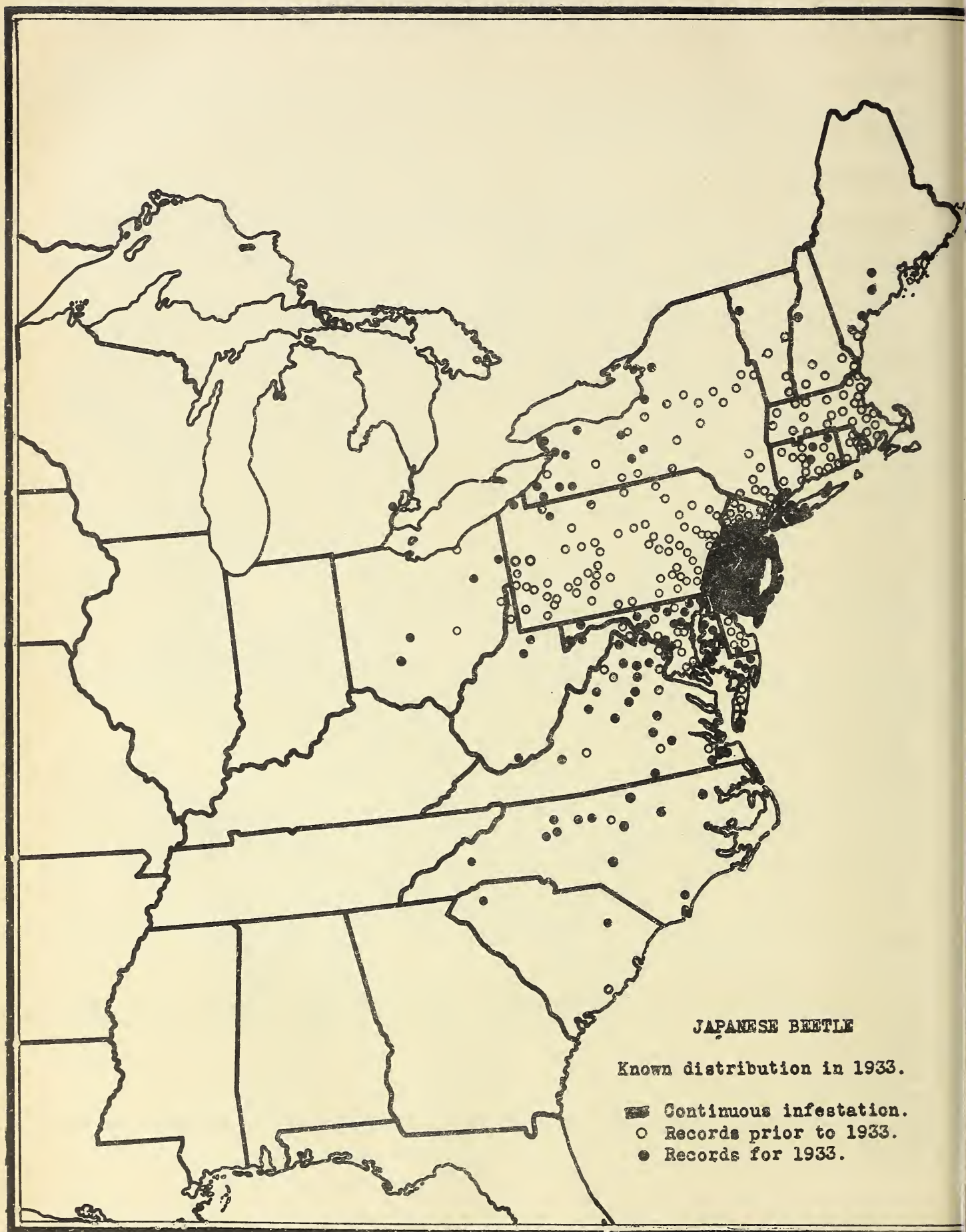
PERIODICAL CICADA

Brood XIX of the periodical cicada (Magicicada septendecim tredecim Riley), the largest of the 13-year broods, appeared in great numbers throughout the greater part of its range. Two records from southeastern Kansas filled in a gap in the western limit of this brood. Three records from eastern Kentucky apparently extended the limits somewhat north of the previously known range. The interpretation of these, however, is confused by the problematical Brood VII of the 17-year race. Brood VII, a small compact brood in the Finger Lakes district of New York, was due to appear this year. There are a few scattered records of a single year's appearance of this brood in western Pennsylvania and southern West Virginia. The Finger Lakes records have been repeated over a period of 136 years, but, strange to say, no records were made this year, although the brood was reported from seven counties in 1916. The insect was reported from two counties in the south-central part of Pennsylvania. No previous records for this brood have been made from this part of the State; and the individuals were probably retarded or accelerated specimens of another brood, as are possibly those of the previous records of this brood beyond the western New York State area. This year brood XIX appeared in the following States and counties:

- Alabama, Blount, Bullock, Chambers, Cherokee, Chilton, Clarke, Coosa, Crenshaw, Dallas, Elmore, Etowah, Jefferson, Lauderdale, Lawrence, Lowndes, Madison, Montgomery, Morgan, St. Clair, Shelby, Talladega, Tallapoosa, Wilcox.
- Arkansas, Ashley, Baxter, Benton, Boone, Bradley, Calhoun, Carroll, Clark, Clay, Cleveland, Conway, Craighead, Crawford, Dallas, Drew, Fulton, Garland, Greene, Hot Spring, Howard, Izard, Jefferson, Lawrence, Little River, Lonoke, Madison, Marion, Pike, Polk, Pope, Pulaski, Searcy, Sevier, Sharp, Union, Washington, White.
- Georgia, Bibb, Chattooga, De Kalb, Floyd, Fulton, Gordon, Houston, Lincoln, Peach, Pulaski, Telfair, Whitfield, Wilcox.
- Illinois, Adams, Bond, Champaign, Clark, Clay, Coles, Cumberland, Gallatin, Hardin, Iroquois, Jackson, Jersey, Johnson, Livingston, Macon, Madison, Marion, Monroe, Montgomery, Morgan, Peoria, Piatt, Pope, Sangamon, Shelby, Vermilion.
- Iowa, Appanoose, Davis, Des Moines, Henry, Jefferson, Lee, Van Buren.
- Kansas, Cherokee, Montgomery.
- Kentucky, Breathitt, Caldwell, Christian, Crittenden, Grant, Livingston, Lyon, McCracken, Muhlenberg, Pike, Simpson, Todd, Trigg, Union.
- Mississippi, Attala, Choctaw, Clarke, Itawamba, Leake, Lowndes, Oktibbeha, Rankin, Smith, Winston.
- Missouri, Adair, Audrain, Barry, Barton, Benton, Bollinger, Boone, Butler, Cole, Callaway, Camden, Cape Girardeau, Carter, Cedar, Christian, Clark, Clay, Cooper, Crawford, Dade, Dallas, Dent, Douglas, Dunklin, Franklin, Gasconade, Greene, Grundy, Henry, Hickory, Howard, Howell, Iron, Jasper, Jefferson, Knox, Laclede, Lawrence, Lewis, Lincoln, Linn, McDonald, Macon, Madison, Maries, Marion, Miller, Moniteau, Monroe, Montgomery, Morgan, Newton, Oregon, Osage, Ozark, Perry, Pettis, Phelps, Pike, Polk, Pulaski, Ralls, Reynolds, Ripley, St. Charles, St. Clair, Ste. Genevieve, St. Francois, St. Louis, Saline, Schuyler, Scotland, Shannon, Shelby, Stoddard, Stone, Sullivan, Taney, Texas, Warren, Washington, Wayne, Livingston, Putnam, Webster.







North Carolina, Alamance, Bladen, Durham, Franklin, Granville, Guilford,
Halifax, Randolph, Wake, Wilkes.
Oklahoma, Adair, Caddo, Cherokee, Delaware, Logan, McCurtain, Muskogee,
Oklahoma, Ottawa, Payne.
South Carolina, Chester, Greenwood, Lexington, McCormick, Oconee, Richland,
York.
Tennessee, Bradley, Chester, Davidson, Giles, Hamilton, Marshall, Maury,
Putnam, Sumner.
Virginia, Halifax, Henrico.

GIPSY MOTH AND BROWN-TAIL MOTH 6

The first egg clusters of the gypsy moth (Porthetria dispar L.) observed hatching in New England were seen on May 3. Dates of first hatch varied somewhat with the locality, the latest being May 19 for one of the northern points. With the exception of some of the northern localities, hatching was general by May 15 and maximum hatch came a few days later. In the Barrier Zone 32 infestations were found with an aggregate of 1,497 egg clusters. Seventeen of these infestations were found in Massachusetts, thirteen in Connecticut, and two in New York. During the year the total number of acres in which there was partial to complete defoliation was 397,000, as compared with 286,000 in 1932. In New Jersey a single scattered infestation of 112 egg clusters was found in an especially rough section about 6 miles northwest of Morristown. Intensive scouting and thorough treatment of egg clusters were followed by spraying in June. All work was performed by the New Jersey Department of Agriculture. In Pennsylvania the area of known infestation was found to cover about 230 square miles. The exact extent was not found, as hatching forced the discontinuance of scouting. This area, centering near Pittston in Luzerne County, embraced parts or all of 15 towns in Lackawanna and Luzerne Counties. Intensive scouting and clean-up work are being continued. During the year, outside the brown-tail moth (Nygmia phaeorrhoea Don.) quarantine line, 20 towns were found infested in Maine, 18 in New Hampshire, and 5 in Vermont. Much of the southern half of New Hampshire, and a corresponding area in Maine, was densely infested and heavy defoliation resulted. Furthermore, the hibernating webs were extremely abundant in this area late in the fall. In Massachusetts the infestation was generally light, but here and there towns were found with areas of heavier infestation.

SATIN MOTH 6

North of the quarantine line, in Maine the towns of Crystal, Houlton, Molunkus, Reed Plantation, Silver Ridge, Staceyville, and Strong, and in New Hampshire the town of Haverhill, were found infested with the satin moth (Stilpnotia salicis L.). Within the infested area, severe defoliation was recorded in Bangor and Brewer, Me.; Alton, Ashland, Campton, Center Harbor, Freedom, and Laconia, N. H.; and in Yarmouth, Mass. Elsewhere in the infested area the defoliation was not severe, though there was noticeable feeding in many towns.

JAPANESE BEETLE 7

The range of the Japanese beetle (Popillia japonica Newm.) consists of two quite distinct subdivisions: One, the area of continuous infestation which the beetle has come to occupy as a result of its natural spread from the original point of introduction; the other, the area of discontinuous or localized infestation which resulted primarily through artificial means of transportation, with the consequent establishment of colonies isolated from each other and from the main body of population. The former area is largely confined to portions of New Jersey, Pennsylvania, and Delaware, with minor protrusions into adjoining sections of Maryland and New York. The area of discontinuous infestation has been extended as far north as Waterville, Me., Woodsville, N. H., Burlington, Vt., Watertown, N. Y., westward to Detroit, Mich., and Columbus, Ohio, and southward through Princeton, W. Va., and Asheville, N. C., to Florence and Greenville, S. C. A still more southern limit was reached in the latter State at Charleston, where four beetles were taken in 1931, but where none has been taken since, despite the fact that efforts to trap them there have been made each year. Owing probably to the general reduction of beetle population during 1933, many parts of the area of continuous infestation show only a slight advance beyond the limits reached in 1932. This was particularly true toward the north. The area of continuous infestation for the first time penetrated into Maryland. Probably the most striking expansion of this area was that which took place in Delaware. The most impressive feature of the infestation in 1933 was the great reduction in the beetle population in the section that has been longer infested compared with the number present in 1932.

ASIATIC BEETLES 8

There is almost no change in the known distribution of the Asiatic beetle (Anomala orientalis Waterh.), and, aside from the record of collections of the Asiatic garden beetle (Autoserica castanea Arrow) in Aiken, S. C., nothing of great importance has been found in the distribution of this beetle.

ELM LEAF BEETLE

In scattered localities in New England, the Middle Atlantic States, and East Central States the elm leaf beetle (Galerucella xanthomelaena Schr.) was very abundant. At one place in Virginia the larvae were badly infected with a fungous disease and their dead bodies around the bases of trees were so numerous that the odor was offensive. Spraying for the control of this pest in the larger towns and cities was quite generally practiced. We also received a report of heavy defoliation in the Yakima Valley of Washington and the Yosemite Valley of California.

BARK BEETLES

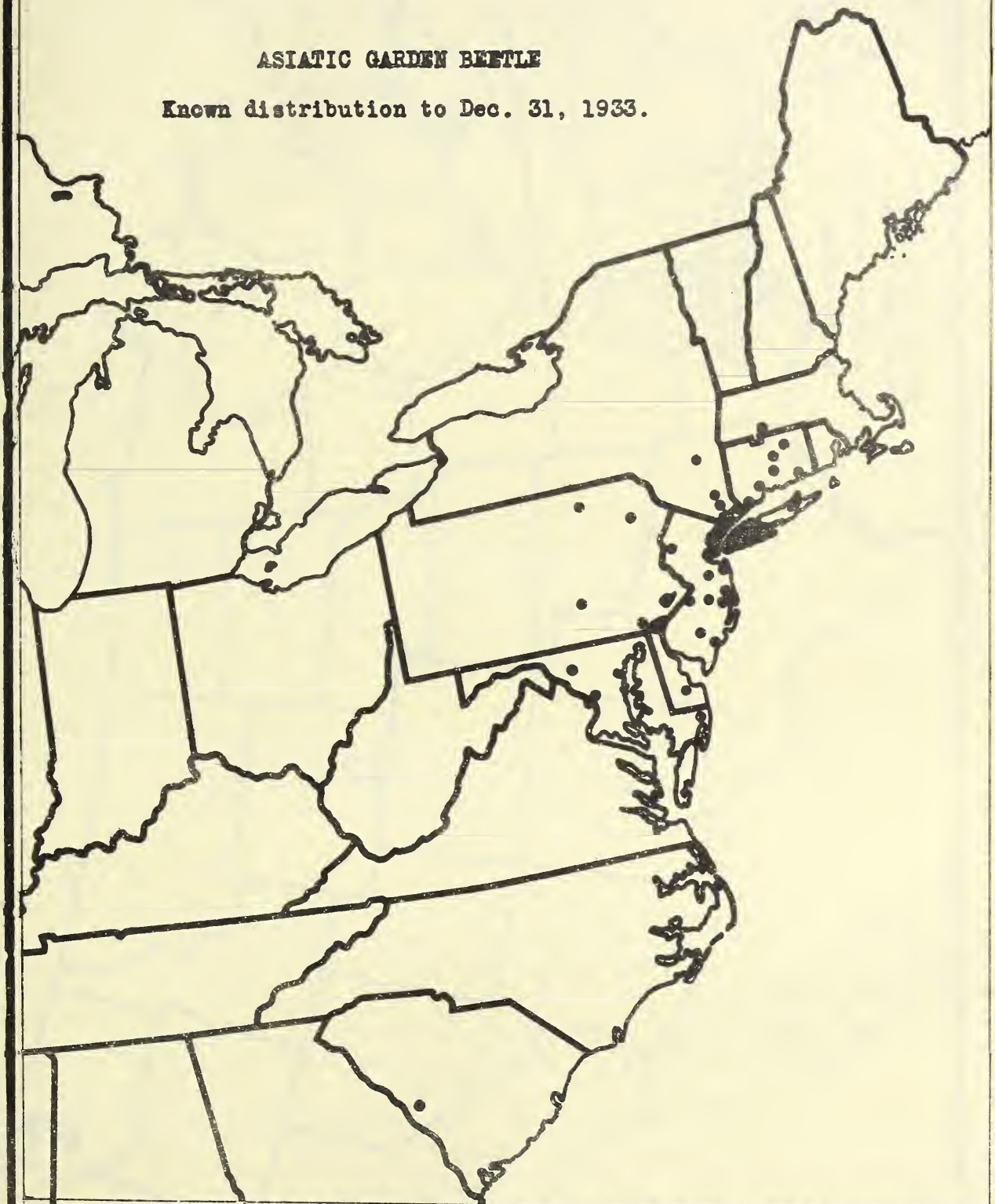
An epidemic of the western pine beetle (Dendroctonus brevicomis Lec.), which has been very destructive since 1917, is now definitely on the wane in some localities. The number of trees killed in 1933 was from 50 to 90

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ASIATIC GARDEN BEETLE

Known distribution to Dec. 31, 1933.







LESSER CORN STALK BORER

Known distribution to Dec. 31, 1933.

Black dots indicate 1933 records.

Large circles indicate that we have a record for the state only.

OUTLINE MAP OF THE UNITED STATES



percent less than those killed in 1932. This drop in population was believed to be the result of the very severe winter temperatures of 1932-33. The outbreak of the mountain pine beetle (D. monticolae Hopk.) in the Beaverhead National Forest of Montana has been increasing since 1926, until last year (1932) it covered over 1,000,000 acres of forest, and 17,500,000 trees had been killed. Following the very severe winter temperatures of 1932-33, the beetle population in the Beaverhead and adjacent forests was reduced to such an extent that in 1933 the number killed was but 5 percent of the number killed in 1932. There was no beetle survival above the snow line in this region. In the Sierra Forest of California conditions are also very favorable, the beetle population being the lowest since 1923.

GLADIOLUS THRIPS

During the year the gladiolus thrips (Taeniothrips gladioli M. & S.) continued to be reported as a serious pest of gladiolus. In addition to the territory already known to be infested, it was reported for the first time in the vicinity of Milwaukee, Wis., at several points throughout Iowa, in which State a few specimens were collected in 1932, in Eddy County, N. Dak., and at Fort Collins, Colo.

SCREW WORM

Late in the season a severe outbreak of the screw worm (Cochliomyia macellaria Fab.) occurred in northern Florida and southern Georgia, where horses, cattle, and dogs were attacked. The infestation covered 30 counties in southern Georgia from the Alabama-Georgia State line to the coast, and 12 counties in northern Florida. Infestations were found on deer, sheep, goats, cats, and even man, in addition to those on the above-named hosts. Losses were heavy both in dead animals and in the cost of medication. This is the first record of a serious infestation in the Southeastern States. An outbreak developed in southern Mississippi, where the principal injury was occasioned to sheep. During September the number of cases of injury in southern and southwestern Texas doubled. In the Gulf Coast district of Texas stockmen reported that 35 percent of the cattle were infested. The outbreaks from Florida to Texas were closely associated with excessive rainfall and high temperatures during August and early in September.

NEW AND LITTLE KNOWN PESTS

Otiiorhynchus ligustici L. is a well known weevil that attacks a wide variety of plants throughout Europe and the Near East. The larvae feed on roots and the adults feed on buds and leaves. In Europe it is known to feed on alfalfa, turnip, asparagus, clover, sugar beet, grape, peach, and strawberry. It was first recorded in North America in 1933, when specimens were collected on newly-set raspberry at Oswego, N. Y.

Sitona cylindricollis Fab. is a European weevil known to attack sweetclover. It was first recorded on this continent in 1933 at Middlebury, Vt., where it so severely injured young sweetclover as to necessitate replanting. It was also found on the New York side of the Lake Champlain valley, and at Storrs, Conn., and Amherst, Mass.

Platynota stultana Wals., a tortricid leaf tier, was described (Trans. Ent. Soc. Lond., p. 127-8, 1884) from Sonora, Mexico. It has also been known in southern California for several years. In 1933 it was found damaging the new growth on about 15 percent of the 100,000 rose plants in a greenhouse in Alexandria, Va. In Mexico and California it is recorded as attacking cherimoya, red pepper, bell pepper, grapefruit, orange, cotton, walnut, avocado, and several other plants.

Ptinus tectus Boieldieu, a beetle, described from Tasmania (Ann. Soc. Ent. France IV, p. 652, 1856), is widely distributed in Europe, where it attacks stored articles, including dried milk, cereals, chocolate, pepper, fish meal, fertilizer, and woolen carpets. The first record on this continent was made in the winter of 1931-32 at Vancouver, B. C., and later that year it was found in stored fish meal in California and in imported fertilizer in Washington.

SUMMARY OF INSECT CONDITIONS IN HAWAII FOR 1933

O. H. Swezey

There were no outbreaks of the sugarcane leafhopper, Perkinsiella saccharicida Kirk., of any consequence. This insect is controlled by its most important natural enemy, the Fijian bug Cyrtorhinus mundulus (Bredd.), which sucks the eggs.

Rhabdocnemis obscura (Boisd.) is generally well controlled by the New Guinea tachinid Ceromasia sphenophori Vill. In particular locations, and with some varieties of cane, there is appreciable damage.

The Asiatic beetle, Anomala orientalis Waterh., continued prevalent in a particular area of one of the large sugar plantations, but the actual damage to the cane by its grubs was evidently slight, as the plantation produced a record crop.

The Chinese rose beetle, Adoretus sinicus Burm., continues as prevalent as ever as a garden pest. During the summer over 2,000 adults of the parasite Tiphia lucida Ashm. were liberated in favorable places.

The pink sugarcane mealybug, Trionymus sacchari (Ckll.), is now well controlled by the Philippine parasite Anagyrus saccharicola Timb., introduced in 1930.

The pineapple mealybug, Pseudococcus brevipes (Ckll.), is becoming of less importance in pineapple fields as better spraying methods and field practices for control are being made use of. This mealybug is apparently increasing in cane fields.

The Chinese grasshopper, Oxya chinensis Thunb., was less prevalent in some of the sections, where it was attacking sugarcane. The egg parasite Scelio pembertoni Timb., introduced from the Malay States in 1930, has been recovered in a few places.

The corn ear worm, Heliothis obsoleta Fab., was very injurious to green corn, hardly an ear escaping injury.

The Mediterranean fruit fly, Ceratitidis capitata Wied., continues as the worst fruit pest. Mangoes were considerably attacked.

The mango weevil, Cryptorhynchus mangiferae Fab., was found in about half of the mango seeds during the first half of the summer, but in only about one third of the seeds in the latter part of the season.

The pepper weevil, Anthonomus eugenii Cano, was found for the first time in a Honolulu garden in February 1933. Since then it has been found widely spread on the island of Oahu, and was taken once on one of the other islands. Besides infesting the various garden peppers, this weevil is also infesting the fruits of eggplant and the common nightshade weed, Solanum nigrum.

The gladiolus thrips, Taeniothrips gladioli M. & S., has greatly interfered with the growing of gladiolus. Some gardeners have entirely abandoned growing it.

Hemichionaspis minor (Mask.) continues to make inroads on hibiscus hedges. If it is not taken care of when found it eventually kills the bush and spreads along the hedge.

Orthezia insignis Dougl. attacks many kinds of ornamental plants and continues its destructive work on lantana in various parts of the islands where lantana is a pest plant, not always killing it outright, but injuring it and checking seed production.

An immigrant mirid bug, Pycnoderes quadrimaculatus Guerin, which was first found in Hawaii in 1929, has this year been reported as quite injurious to string beans.

The koa moth, Argyroploce illepida Butl., which usually is so destructive to the seeds of the endemic koa tree (Acacia koa), destroyed only from 25 to 60 percent of the seeds. The larvae have been quite common on macadamia nuts, the injury being done chiefly in the husk. The seeds of a native tree (Alectryon macrococcus) were found badly infested.

The coconut leafroller, Omiodes blackburni Butl., which has not done conspicuous damage to coconut leaves in Honolulu in the past 5 or 6 years, attacked the young trees badly this summer in a section of the city, giving the trees a very ragged appearance. This outbreak finally subsided, and examination showed an abundance of cocoons of the parasite Cremastus hymeniae Vier., equivalent to a parasitization of 82 percent. Several other parasites had also been a factor.

The rice borer, Chilo simplex Butl., has not been so serious, the last ripening crop appearing to be about normal. On account of the ravages of this pest when it first made its appearance, there was considerable reduction in the acreage of rice, and much of the land has been utilized for growing truck crops instead.

The subterranean termite Coptotermes formosanus Shiraki continues to be very destructive to wooden structures in Honolulu.

